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Procedia Engineering 32 (2012) 342 – 347

Procedia Engineering

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I-SEEC2011

# Design of information environment chicken farm for management which based upon GPRS technology

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**Elsevier use only:** Received 30 September 2011; Revised 10 November 2011; Accepted 25 November 2011.

**Abstract**

We present data packet for by sending short message (SMS)[1] service system which system monitoring and administrator chicken farm. By the temperature sensing and checking status Air-conditioner inner of farm. Which the data packet send through via GPRS technology. We can show the message via display of mobile phone. Where in this work, the security of life chicken And the administrator have comfortable and immediately.

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Keywords: SMS; Data Packet; Protocol; GPRS Technology

## 1. Introduction

*System overview*

Currently, farming is deemed to be the principle occupation of farmers. In each year, Thailand has large amount of flesh product exportation and chicken is one part of such product.

Chicken farming has to consider several factors including the proper size of chicken house for chicken in each age as well as the temperature in chicken house. The authors concern the issue of increasing temperature in chicken house without recognition of farm's owner leading to the death of several chickens. As a result, we made this project to supervise such event.

When temperature is higher and air-conditioner is out of service, there will be a micro controller to monitor current temperature and compare with the setup temperature. When reaching the determined value then the system will examine air-conditioner operation. If the air-conditioner is out of service then the data will be sent to the telephone number of farm's owner in the form of SMS for further checking.

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doi:10.1016/j.proeng.2012.01.1277

Such event is shown in Fig. 1. However, in the event of exceeded temperature but the air-conditioner is still working, the system will not transfer any output data.

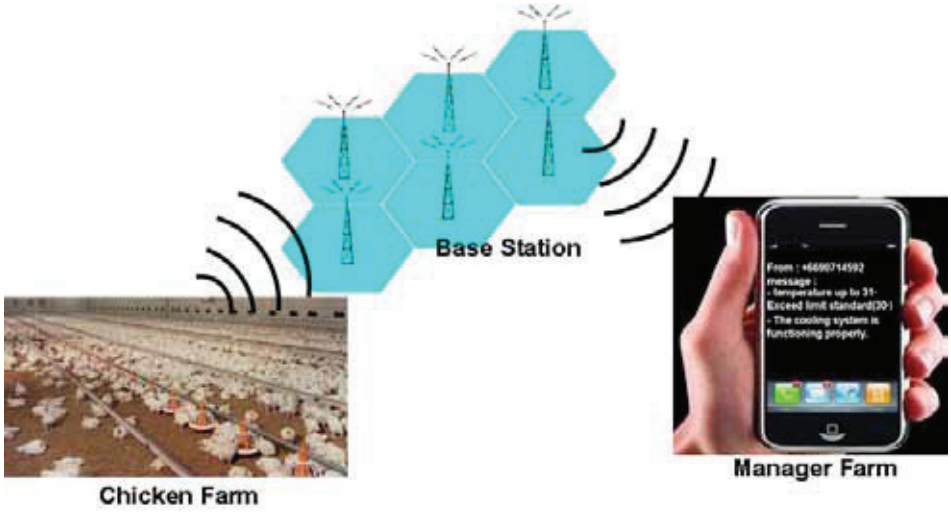


Fig. 1. Show the overview system

## 2. Theory and Background

*GPRS module*

SMS is a text based message on mobile network, created by Friedhelm hillebrand, the researcher in communication and head of management committee of GSM association in additional service division. There are two reasons why the SMS is 160 characters long text message. First, from research information, most of text in postcard has characters not exceed 150. Second, from the sending message via telex, still has characters equal to postcard [3].

AT-COMMAND is a standard program with the capability to operate with communication devices such as Modem or DTE Equipment (Data Terminal Equipment) to respond, setup or command such equipment to operate as required. For communicating with mobile phone, the communication will use the program called GSM AT COMMAND

Samples of BASIC AT COMMAND

- AT to examine the availability of equipment, if available, the device will answer back with "OK"
- ATDT phone number to call to destination number
- ATH hang up
- ATA answer the call

AT COMMAND related to SMS sending and receiving

There are several types of AT COMMAND program used with mobile phone including mobile phone model reading, battery checking, signal examination. However, we will mention only the command related to SMS sending and receiving only.

1) Message Format (AT+CMGF) is the command to determine the form of displayed message by
   AT-CMGF = 1 or displaying message in the form of TEXT
   AT-CMCF = 0 or displaying message in the form of PDU CODE
2) List Message (AT+CMGL) is the command to display message in several status with displaying all messages. The command is as followed:
   AT+CMGL=0 or displaying received message without reading (“REC UNREAD”)
   AT+CMGL=1 or displaying received message and already read (“REC READ”)
   AT+CMGL=2 or displaying stored message without sending (“STO UNSENT”)
   AT+CMGL=3 or displaying stored and sent message (“STO SENT”)
   AT+CMGL=4 or displaying all messages (“ALL”)

**Remarks**: In the event of determining Message Format to be PDU CODE, the status will be selected by using 0-4. On the other hand, in the event of determining Message Format to be TEXT, the status will be selected by using the text in the later parenthesis.

3) Read Message(AT+CMGR) is the command to read the specific message by determining the location of such stored data

Send Message (AT+CMGS= “XX”) is the command for sending message which “XX” is Octet number of Hexadecimal except the first Octet that is “00”.

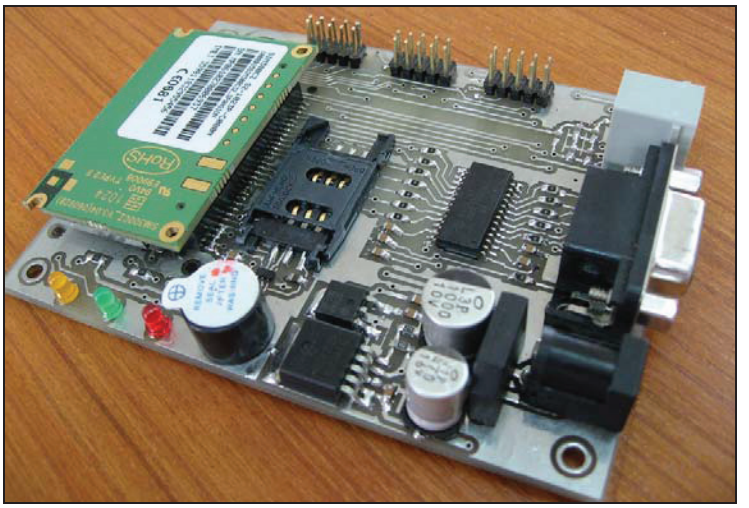

Fig. 2. Show the SIM300CZ GSM module

In our research, we use SIM300CZ GSM module [4] to receive the SMS message via AT command protocol. AT command is a set of ASCII using to communicate the modem with PC. It proposed by Hayes Communications in 1977. SIM300CZ has two SMS modes, PDU and text mode. PDU receive and display the status in binary code format, but text mode in ASCII with ease to translate and use. In order to receive message, Main control has to send “AT+CMGF=1” command to the module to entering text mode. If there are new message receive, the module response by sending out the command such as

+cmgs= “telephone number” with mean there is a new message in memory is “ -temperature up to 31° Exceed limit standard(30°)

- The cooling system is functioning properly.”. Then send “AT+CMGS= “+66890714592”” command to the module to read message in memory as show in Fig. 3.

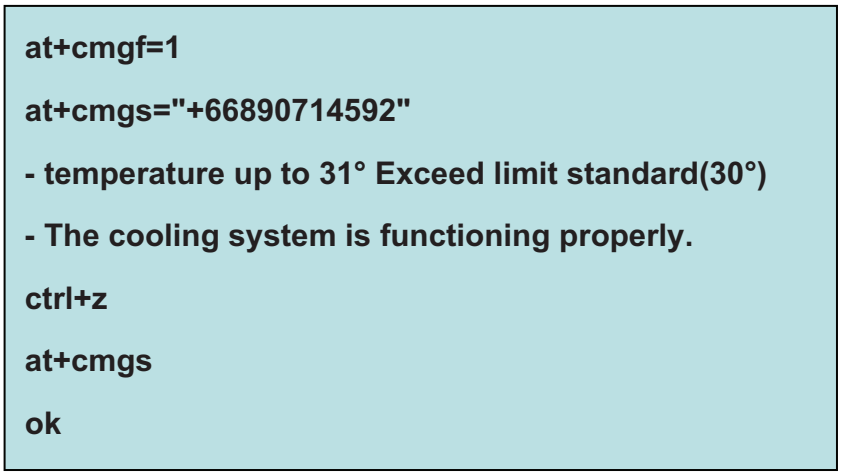


Fig. 3. Show the new massage of system status

In Fig. 3. Show the message of system of system status as show. The 1st line is The AT command +CMGF is used to instruct the GSM / GPRS modem to operate in SMS text mode. The result code "OK" is returned (line 4), which indicates the command line "AT+CMGF=1" has been executed successfully. If the result code "ERROR" is returned, it is likely that the GSM / GPRS modem does not support the SMS text mode. To confirm, type "AT+CMGF=?" in the HyperTerminal program. If the response is "+CMGF: (0,1)" (0=PDU mode and 1=text mode), then SMS text mode is supported. If the response is "+CMGF: (0)", then SMS text mode is not supported. The 2nd line is The AT command +CMGW is used to write an SMS text message to the message storage of the GSM / GPRS modem. "+66890714592" is the recipient mobile phone number. After typing the recipient mobile phone number, you should press the Enter button of the keyboard. The GSM / GPRS modem will then return a prompt "> " and you can start typing the SMS text message "A simple demo of SMS text messaging.". When finished, The 3rd line is message show – temperature up to 31°C Exceed limit standard(30°), The 4th line is message show “The cooling system is functioning properly”, The 5th line is press Ctrl+z of the keyboard, The 6th line is The AT command +CMGF is used send message, The 7th line is confirms message OK.

*Firmware function*

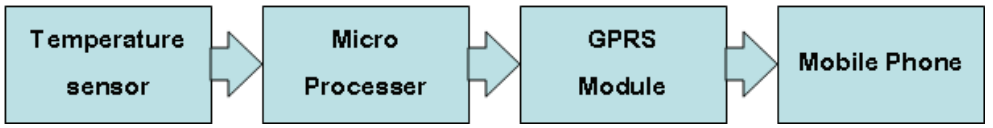


Fig. 4. Show the process of the system all

Our system will start with measuring the temperature by the sensor. The obtained measurement will have temperature unit as Degree Celsius obtained from value transformation of indicator’s voltage of sensor. Then the value will be transferred to micro controller to examine the value from temperature

measurement with the determined temperature appropriate for chicken farming. When the temperature reaches to the determined temperature then the command will be determined at command for activating GPRS module operation in the form of SMS to provide alert message to the specific telephone number.

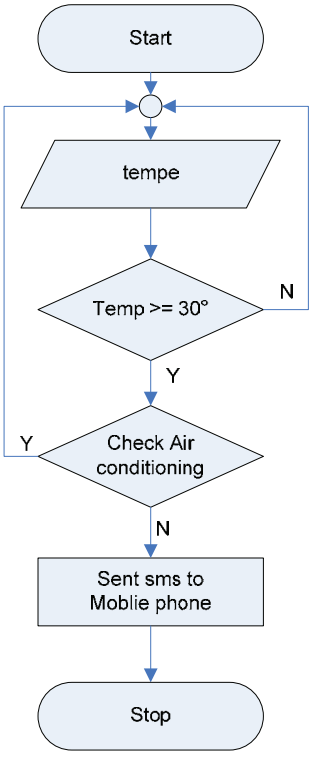


Fig. 5. Flow chart over all process

In Fig. 5 show the flowchart of the process chicken farms The Process consist of the temperature checking limit to more than 30°C

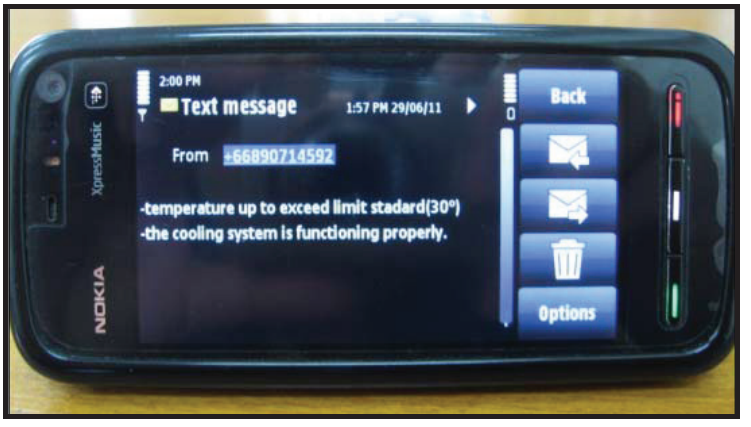


Fig. 6. The system with sliding text message

## 3. Conclusion

The result will be another warning for chicken farm's owner. This will improve chicken farming with security, quality and quantity. As a result, the farmer will get higher income. This system is able to be applied with other value transferring for warning or storing, for example, transferring the data of biogas quantity transferring in fermenting from piggery farm in order to know the exiting amount. Temperature indicator is able to be changed to be quantity indicator. We present the GPRS module is able to applied more than sending the data in the form of SMS as well, for example, sending in the form of data packet. This application is up to the utilization of internet provider. Overall, the presentation in this document is only a concept and presentation of a preliminary stage. It requires a functional test of the device, some method contents and some steps of machine working need to be improved. These problems had been solved in the experiment on side chicken farm.

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